

**REMARKS**

Claims 1-16, 27 and 28 are pending after entry of this paper. Claims 1-16, 27, and 28 have been rejected. Claims 17-26 have been withdrawn and are pending. Applicants reserve the right to pursue the withdrawn claims in a continuing application.

Reconsideration and withdrawal of the rejections in view of the above claim amendments and below remarks are respectfully requested.

**May 16, 2008 Related Case Submission**

Under MPEP §2001.06(b), it is suggested that disclosure be made of related pending applications which may contain or refer to information that is “material to patentability” of the subject patent application. In the spirit of this provision, applicants have previously identified pending patent applications in a paper captioned “Related Case Submission” filed on May 16, 2008. Applicants wish to point out that most of said related patent applications have been subject to examination by the USPTO by several different examiners in several different art units and references have been cited by examiners in at least some of those applications. For the convenience of the Examiner, applicants attach PTO-892 reference forms (see Appendix A) which have been prepared by examiners in those related applications.

**Response to Rejections Under 35 U.S.C. §102(e)**

The Examiner has rejected claims 1-5, 7-11, 14-16, and 27 under 35 U.S.C. §102(e) as allegedly being anticipated by International Publication Number WO 2004/056465 (“Nuber”). Applicants herein formally make of record a translation of the foreign priority document (German Patent Application No. 102 60 739.7, filed December 23, 2002). The

translation (see Appendix B) is a certified true translation of the foreign priority document.

Applicants believe this to be sufficient to establish a priority date of December 23, 2002 for the instant application. Therefore, applicants submit that Nuber is not available as prior art against the instant application under any subsection of 35 U.S.C. §102. Accordingly, applicants respectfully request reconsideration and withdrawal of the rejection of claims 1-5, 7-11, 14-16, and 27 under 35 U.S.C. §102(e).

Response to Rejections Under 35 U.S.C. §103(a)

The Examiner has rejected claims 6, 12, 13, and 28 under 35 U.S.C. §103(a) as allegedly being obvious over Nuber in view of U.S. Patent Number 6,015,539 (“Schmidt”) or U.S. Patent Number 5,269,236 (“Okuno”). As discussed *supra*, applicants submit that Nuber is not available as prior art. Accordingly, applicants respectfully request reconsideration and withdrawal of the rejection of claims 6, 12, 13, and 28 under 35 U.S.C. §103(a) over Nuber in view of Schmidt or Okuno.

Claims 1-5, 7, 9-12, 14-15, and 27 have been rejected under 35 U.S.C. §103(a) as allegedly being obvious over Schmidt in view of U.S. Patent Number 5,505,907 (“Hiltunen”) or over Hiltunen in view of Schmidt (page 8 of the Office Action).

Regarding claim 1, the Examiner specifically contends that it would have been obvious to combine the process for producing aluminum oxide from aluminum hydroxide and the Froude number control of Schmidt with the reactor design of Hiltunen (page 8 of the Office Action). The Examiner further contends that one would have been motivated to incorporate the

reactor design of Hiltunen because of the alleged teaching of reduced fouling and improved heat exchange. Finally, the Examiner contends that it would have been obvious to control the fluidized bed process of Hiltunen by using the particle Froude numbers of Schmidt (pages 8-9 of Office Action). Applicants respectfully disagree and address the rejections as they pertain to independent claim 1.

The Examiner has cited Schmidt for allegedly disclosing the general process of producing aluminum oxide from aluminum hydroxide and control of the process using Froude numbers (page 8 of Office Action). The Examiner admits that Schmidt fails to teach any of the elements of the annular fluidized bed as recited in instant claim 1 (page 8 of Office Action).

The Examiner contends that Hiltunen describes a fluidized bed reactor having a gas supply tube partly surrounded by a stationary annular fluidized bed (page 8 of Office Action). The Examiner further contends that in Hiltunen, particles from the bed overflow the edges into the tube and are entrained in the hot gas supply (page 10 of Office Action).

Hiltunen is directed to a method for cooling hot gas by contacting it with large amounts of cool solid particles from the fluidized bed (see abstract of Hiltunen). The gas containing the particles is conveyed through the riser **22** into the upper section of the reactor where solid particles are separated from the gas in a particle separator and returned to the outer parts of the fluidized bed via return duct **36** (column 4, lines 35-55 of Hiltunen). Hiltunen, as the Examiner admits, is completely silent as to controlling particle Froude numbers (page 9 of Office Action). Indeed, one of ordinary skill in the art would not contemplate applying particle Froude numbers to the method of Hiltunen, primarily because there is no need to adjust the flow characteristics of particles in this context. Specifically, optimization of the mass and heat transfer within the riser **22** is unnecessary to accomplish the objective of Hiltunen, namely to

cool the hot gas. The particles do not have to be heated up to a uniform temperature in Hiltunen, as it is sufficient for the particles merely to absorb heat from the gas to accomplish the objective. The particles will afterwards be cooled by heat transfer means in the return duct **36** and fluidized bed **14** (column 4, lines 36-38 of Hiltunen).

The method as recited in claim 1 is described in the specification at page 2, lines 29-33 (emphasis added):

When passing through the upper region of the central tube, the first gas or gas mixture entrains solids from the annular stationary fluidized bed . . . into the mixing chamber, so that, due to the high speed differences between the solids and the first gas, an intensively mixed suspension is formed and an optimum heat and mass transfer between the two phases is achieved.

As the Examiner is well aware, the claims must be interpreted in light of the specification (see MPEP §2106). With respect to claim 1, the specification makes clear that adjusting the particle Froude numbers to a particular value is necessary in order to achieve the intensively mixed suspension and optimum heat and mass transfer between the two phases (page 2, lines 31-34; page 3, lines 29-33 of Specification). The development of such an intensively mixed suspension in the reactor of Hiltunen is unnecessary. Furthermore, there is no teaching, suggestion, or motivation in Hiltunen that would lead one of ordinary skill in the art to desire to control the fluidized bed, as the Examiner contends, let alone to look to particle Froude numbers to do so in the method of Hiltunen.

The Examiner contends that one of ordinary skill in the art would look to particle Froude numbers as allegedly disclosed in Schmidt to “operate the [fluidized bed] process” of Hiltunen (page 9 of Office Action). Regardless of the specific teachings of Schmidt, this rationale does not support a *prima facie* case of obviousness. Merely because one could control

fluidized beds using particle Froude numbers does not necessarily mean that one of ordinary skill in the art would choose to do so. There must be some teaching, suggestion, or motivation, either within Hiltunen itself, or within the art in general, that would lead one of ordinary skill in the art to desire to control the fluidized bed. As discussed above, there is no such disclosure of particle Froude numbers in Hiltunen. Indeed, the very purpose of Hiltunen, namely to cool hot gas, implicitly teaches away from controlling the fluidized bed by particle Froude numbers, because of the absence of a necessity to control or optimize the heat and mass transfer to successfully accomplish this objective. Accordingly, applicants respectfully assert that the rationale for modifying the method of Hiltunen with the particle Froude numbers of Schmidt does not properly support a *prima facie* case of obviousness (see MPEP §2141).

Furthermore, assuming that a motivation to modify Hiltunen to control the fluidized bed exists, one of ordinary skill in the art would not look to Schmidt, or the particle Froude numbers disclosed therein, to do so because Schmidt discloses a traditional circulating fluidized bed reactor (column 1, lines 7-8). In contrast to Schmidt, claim 1 recites stationary annular fluidized bed reactor. Schmidt discloses a range of Froude numbers that are obtained during operation of the circulating fluidized bed (column 2, lines 32-40). In contrast, claim 1 requires adjusting particle Froude numbers to particular ranges in the gas supply tube, annular fluidized bed, and mixing chamber of the fluidized bed reactor. Indeed, these sections are not even present in the circulating fluidized bed reactor of Schmidt. The Froude numbers disclosed in Schmidt pertain only to the operating conditions in a circulating fluidized bed and not to the transport of solid particles from a stationary annular fluidized bed. Accordingly, one of ordinary skill in the art reading Hiltunen and Schmidt would not be motivated to adjust particle Froude numbers in the reactor of Hiltunen to arrive at the invention as claimed in claim 1. Applicants

therefore respectfully request reconsideration and withdrawal of the rejection of claim 1 under 35 U.S.C. §103(a).

The Examiner has also rejected claims 13 and 28 over Schmidt in view of Hiltunen and in further view of Okuno and claim 6 over Schmidt in view of Hiltunen and in further view of U.S. Patent Number 4,822,592 (“Misra”). The Examiner applies Okuno for allegedly teaching the method of injecting water into the fluidized bed for cooling purposes and Misra for the process of forming alumina from an aluminum compound (pages 11-12 of Office Action). Applicants respectfully submit that Okuno and Misra fail to remedy the deficiencies of Schmidt and Hiltunen as discussed *supra*. Thus, applicants respectfully request reconsideration and withdrawal of the rejection of dependent claims 6, 13, and 28 under 35 U.S.C. §103(a).

#### Dependent Claims

Applicants have not independently addressed all of the rejections of the dependent claims. Applicants submit that for at least similar reasons as to why independent claim 1 from which all of the dependent claims 2-16, 27 and 28 depend are believed to be allowable over the prior art as discussed *supra*, the dependent claims are also believed to be allowable. Applicants reserve the right to address individual rejections to dependent claims at a future time should it be deemed necessary or appropriate.

Response to Provisional Non-Statutory Double Patenting Rejections

The Examiner has provisionally rejected claims 1-5 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over each of claims 1-5 of copending Application No. 10/540,376 (US 2006/0162500) and claims 1-5 of copending Application No. 10/540,435 (US 2007/0137435). The Examiner has also provisionally rejected claims 1-5, 7, 11, and 15 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over each of claims 1-5, 7, 11, and 12 of copending Application No. 10/540,436 (US 2006/0231466) and claims 1-5 and 13 over each of claims 1-5, 9, and 20 of copending Application No. 10/540,438 (US 2006/0249100). Since the conflicting claims have not in fact been patented, this is a provisional obviousness-type double patenting rejection.

In response, applicants respectfully request that the provisional double-patenting rejection be held in abeyance due to the provisional nature of the rejection until one of the applications is allowed. Upon notice of otherwise allowable subject matter, applicants will address the rejection. Applicants note that it is proper when dealing with otherwise allowable subject matter in co-pending applications to withdraw a provisional rejection in the most advanced application, allow it to issue, and make a (non-provisional) rejection in the remaining application.

Applicants note that Application No. 10/540,438 was allowed on April 24, 2008, and the Issue Fee was timely paid on July 24, 2008. Therefore, in the interest of advancing prosecution of the instant application, applicants provide herewith a terminal disclaimer which obviates the obviousness-type double patenting rejection that could properly be made upon issuance of a patent from Application No. 10/540,438. Withdrawal of the rejection is respectfully requested.

**CONCLUSION**

Based on the foregoing amendments and remarks, the applicant respectfully requests reconsideration and withdrawal of the election requirement of claims and allowance of this application. Applicants respectfully request favorable consideration and early allowance of the instantly pending claims.

**AUTHORIZATION**

The Commissioner is hereby authorized to charge any additional fees which may be required for consideration of this Amendment to Deposit Account No. **13-4500**, Order No. 4791-4012.

In the event that an extension of time is required, or which may be required in addition to that requested in a petition for an extension of time, the Commissioner is requested to grant a petition for that extension of time which is required to make this response timely and is hereby authorized to charge any fee for such an extension of time or credit any overpayment for an extension of time to Deposit Account No. **13-4500**, Order No. 4791-4012.

Respectfully submitted,  
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Dated: October 23, 2008

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